THE RESTORED SKELETON OF LEPTAUCHENIA DECORA.

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(*Read April 22, 1910.*)

A recent examination of the *Leptauchenia* material in the Princeton University collection has made possible the presentation of the accompanying restoration of the skeleton (Fig. 1), together with some notes on the structure of this animal. Parts of two species are represented, referable apparently, to Leidy's *L. decora* and *nitida* respectively. All the specimens were collected some years ago by Mr. J. B. Hatcher at Corral Draw, in the White River badlands of South Dakota.

In a general way, there is a good deal of resemblance between the writer's restoration of *Leptauchenia* (Fig. 1) and Peterson's reconstruction of *Phenacocœlus*,[1] an animal about one fourth larger, presumably related both to the first mentioned genus and to *Cyclopidius*. The major portion of the skeleton is drawn from two individuals of *Leptauchenia decora* (Nos. 10753, 10773 Princeton University collection) supplemented occasionally by other specimens of the same species. The fore foot is from a somewhat smaller individual of *L. decora* (No. 10770) while the hind foot, with the exception of the tarsus, is enlarged to scale from *L. nitida* (No. 10765). On the whole, the restoration recalls to mind an animal of somewhat pig-like proportions due to the large head, short limbs and short tail which may have been longer than indicated. No certain conclusion can be drawn from the skeleton as a whole regarding the habits of the animal. That it was aquatic inferred from the prominent rim of the auditory meatus implying a "valvular closure of the organ of hearing" to prevent the inflow

[1] Peterson, O. A., "The Miocene Beds of Western Nebraska and Eastern Wyoming and their Vertebrate Faunæ," *Annals of the Carnegie Museum*, Vol. IV., No. 1, p. 32, Fig. 5, 1907.

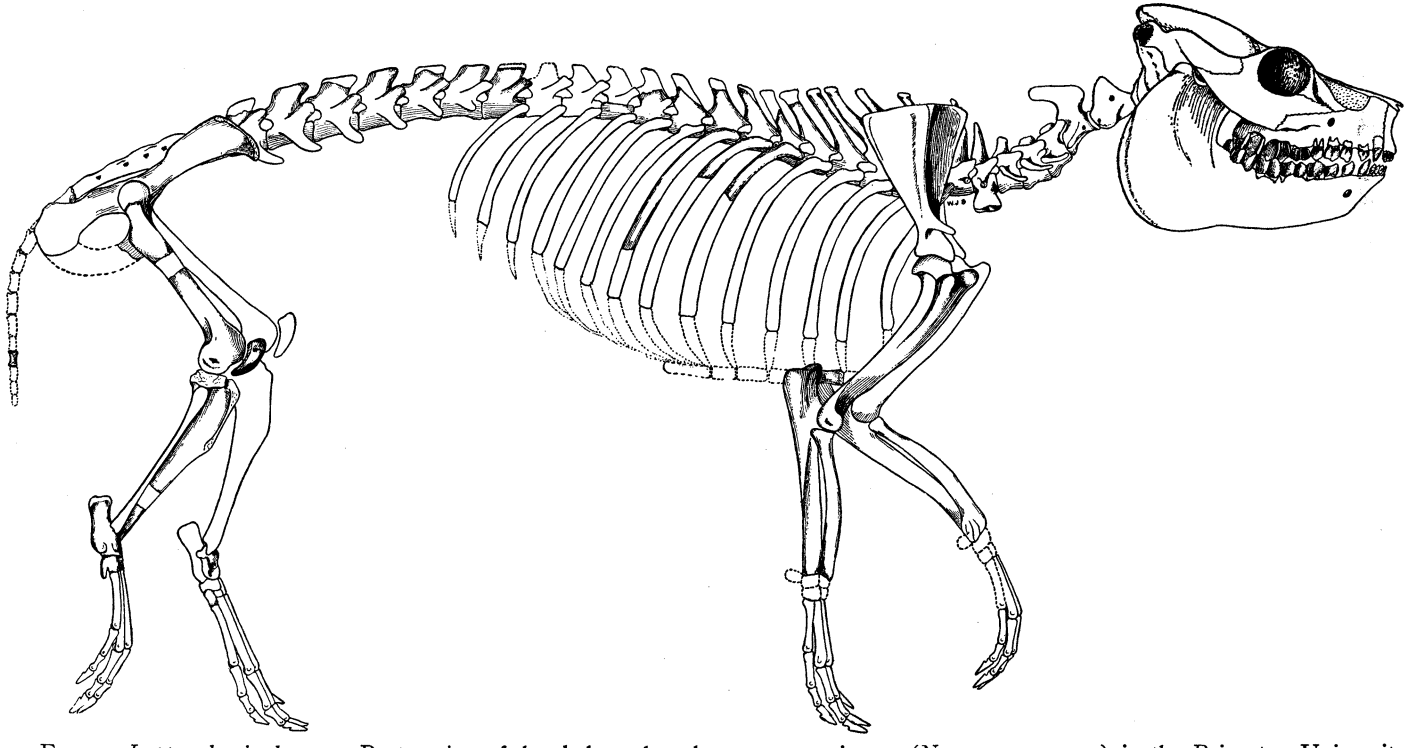

FIG. 1. *Leptauchenia decora.* Restoration of the skeleton based on two specimens (Nos. 10753, 10773) in the Princeton University Collection. Unshaded parts are supplied from other specimens or enlarged to scale from *L. nitida.* Broken lines indicate hypothetical reconstruction. One third the natural size.

of water as suggested by Cope for *Cyclopidius*[2] is not altogether substantiated by the feet, the slender toes of which terminate in small hoof-like elements well adapted apparently, so far as their structure is concerned, to running on firm ground. The slight development of lower incisors and canines indicates, perhaps, that *Leptauchenia* was not a grazing animal, for in modern grass feeders, while the upper incisors and canines may be absent, the lower teeth are broad and flat, well adapted to cropping grasses, while in *Leptauchenia* they are almost cylindrical. A study of the conditions of sedimentation involved in the accumulation of the so-called clays in which the remains of *Leptauchenia* occur will, it is believed, afford a safer clue to its habits than does the anatomy.

As it has not been possible to have detailed drawings prepared it has seemed advisable to omit full description and present merely some notes on the general structure of the skeleton.

Skull.—The prominent orbits, the large facial vacuities extending backward between the eyes, the high and almost straight sagittal crest, the elongated auditory meatus with thickened lip, the heavy arches and the deep mandible are at once apparent from the figure. Coupled with these as generic characters are the enormously expanded auditory bullæ and the reduced condition of the anterior dentition. Some differences in proportion appear between this and a previously published figure of the skull of *Leptauchenia,*[3] due probably to the fact that the latter is a composite.

Vertebral Column.—The dorso-lumbar vertebral formula is twenty, of which fourteen are dorsals. Six vertebræ are coössified in the sacrum, three of them being in contact with the ilium. As shown in the restoration, the anterior dorsals have high narrow spines, sloping backward. These decrease in elevation posteriorly and probably about the twelfth or thirteenth dorsal begin to assume the shape of the wide, transversely flattened lumbar spines. A few proximal caudals are preserved, too few to determine with certainty whether the tail was long or short, but suggesting the

[2] Cope, E. D., "Synopsis of the Species of Oreodontidæ," PROC. AM. PHIL. SOC., Vol. XXI., p. 547.

[3] Scott, W. B., "Beiträge zur Kentniss der Oreodontidæ," *Morphologisches Jahrbuch,* Bd. XVI., Taf. XV., Fig. 15.

latter from their comparatively small size. In the cervical series, the atlas is characterized by a slender inferior arch and broad superior arch with strong backward slope to its dorsal profile. The canal for the vertebral artery perforates the base of the transverse process at the margin of the posterior cotylar surface, where it is inclosed by but a narrow bridge of bone, soon emerging on the lower surface of the process. Some distance anterior to the point of emergence, it again perforates the transverse process, joining the neuro-arterial canal near its point of emergence. The margin of the transverse process is broken in all the specimens examined, but seems to have been circular. The axis carries a large neural spine, of which the dorsal border slopes strongly backward and upward. All the transverse processes of the cervicals are perforated by the vertebral artery.

Girdles.—The scapula is a triangular element of which the outer surface is divided unequally into large post- and small pre-spinous fossæ by the prominent scapular spine, of which the acromion process is directed forward. Of the pelvic girdle, the ilium is broadly expanded in the transverse plane, rather more so than the figure would indicate. The gluteal fossa is shallow and the anterior superior spine quite prominent. The ilio-pectineal eminence varies in prominence in different specimens. Both ischial and pubic rami are stout. Their distal expansions are lacking in all the Princeton specimens.

Limbs.—The strong forward curvature of the radius and heavy olecranon process of the ulna are perhaps the most striking features of the fore limb. Apart from this, there are no peculiarities which call for special comment. It is possible that the lateral digits in both fore and hind foot have not been given sufficient length, the error, if such it be, arising from an attempt to scale the drawing from a few dissociated phalanges. But one terminal phalanx is represented in the Princeton collection, and of this the tip is broken off and the margins somewhat damaged. It seems to have been a small pointed hoof.

PRINCETON UNIVERSITY,
April, 1910.